

## 4.3 NOISE AND VIBRATION

This section is based upon a September 2006 noise report prepared by *Illingworth & Rodkin, Inc.* for the proposed project. The report is Appendix D of this EIR.

### 4.3.1 Introduction and Regulatory Framework

#### 4.3.1.1 *Noise*

Noise is measured in "decibels" (dB) which is a numerical expression of the amplitude of sound on a logarithmic scale. A noise level that is ten dB higher than another noise level has ten times as much sound energy and is perceived as being twice as loud. Sounds less than 5 dB are just barely audible, and then only in the absence of other sounds. Intense sounds of 140 dB are so loud that they are painful and can cause damage with only a brief exposure. These extremes are not commonplace in our normal working and living environments. An "A-weighted decibel" (dBA) filters out some of the low and high pitches which are not as audible to the human ear. Noise impact analyses commonly use dBA to correspond to human hearing as a function of frequency.

Since excessive noise levels can adversely affect human activities (such as conversation and sleeping) and human health, federal, state, and local governmental agencies have set forth criteria or planning goals to minimize or avoid these effects. The noise guidelines are almost always expressed using one of several noise averaging methods such as Leq, DNL, or CNEL.<sup>13</sup> Using one of these descriptors is a way for a location's overall noise exposure to be measured, realizing of course that there are specific moments when noise levels are higher (e.g., when an aircraft is taking off from an airport or a leafblower is operating) and specific moments when noise levels are lower (e.g., during lulls in traffic flows on streets or in the middle of the night). For this report, the DNL will be used as it is consistent with the guidelines of the City of San José and the State of California.

The City of San José's General Plan contains policies and goals which pertain to desired noise levels for various land uses located within the City. These policies and goals are expressed in terms of the DNL. The General Plan cites long-term and short-term exterior DNL goals for residential uses of 55 dBA and 60 dBA, respectively. For new commercial and new residential land uses, where the DNL at a given location is above 60 dBA, an acoustical analysis is required to determine the amount of attenuation necessary to achieve an interior DNL of 45 dBA or less. Outdoor uses on sites where the DNL is above 60 dBA should be limited to acoustically protected areas.

The General Plan also distinguishes between noise from transportation sources and noise from non-transportation (i.e., stationary) sources. The short-term exterior noise goal is 60 dBA DNL for transportation sources. For stationary sources, the exterior noise goal is 55 dBA DNL at the property line between sensitive land uses (e.g., residences, schools, libraries, hospitals, etc.) and non-sensitive land uses (e.g., industrial, commercial, etc.).

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<sup>13</sup>**Leq** stands for the Average Equivalent Level and is a measurement of the average energy level intensity of noise over a given period of time such as the noisiest hour. **DNL** stands for Day-Night Level and is a 24-hour average of noise levels, with 10-dB penalties applied to noise occurring between 10 pm and 7 am. **CNEL** stands for Community Noise Equivalent Level; it is similar to the DNL except that there is an additional 5-dB penalty applied to noise which occurs between 7 pm and 10 pm. As a general rule of thumb where traffic noise predominates, the CNEL and DNL are typically within 2 dBA of the peak-hour Leq. **Lmax** is the maximum instantaneous noise level during a measurement period (i.e., single-event).

The above noise goals notwithstanding, the San José General Plan specifically recognizes that these goals may not be achieved within the timeframe of the General Plan at certain areas of the City which are affected by noise from aircraft, railroads, and roadway traffic. These areas are: 1) the Downtown Core Area, 2) the area around Mineta San José International Airport, and 3) areas adjacent to major roadways. Although the Coyote Valley area is not located in the Downtown Core Area or the San José Airport noise impact zone (defined by the 65 dBA CNEL contour), it is subjected to noise from a number of major roadways (US 101 and Monterey Road). It should be noted that although the General Plan does not describe railroad tracks as major noise sources, the Union Pacific/Caltrain railroad tracks travel through the CVSP Area on the west side of Monterey Road.

As noted above, various policies in the City's General Plan have been adopted for the purpose of avoiding or mitigating noise impacts resulting from planned development within the City. All future development addressed by this EIR will be subject to the noise policies listed in Chapter 4, Goals and Policies, of the City's General Plan, including the following:

- *Noise Policy #1:* The City's acceptable noise level objectives are 55 dBA DNL for the long-range exterior, 60 dBA DNL for short-range exterior, 45 dBA DNL for interior and 76 dBA DNL for maximum exterior noise levels necessary to avoid health effects.
- *Noise Policy #8:* The use of outdoor noise generating equipment should be discouraged.
- *Noise Policy #9:* Construction should use noise suppression devices.
- *Noise Policy #11:* Non-residential land uses should limit noise at residential property lines.
- *Noise Policy #12:* Noise studies are required for certain peak event noise sources.
- *Urban Design Policy #18:* New development should implement sound attenuation with the use of landscaping and site design rather than soundwalls, to the extent feasible.
- *Urban Design Policy #21:* Maximum separation between rail lines and development should be utilized.

In addition to the policies of the San José General Plan, development addressed by this EIR will be subject to the following:

- San José Municipal Code §20.100.450: Limits construction hours within 500 feet of residences to 7 am - 7 pm weekdays, with no construction on weekends or holidays
- Title 24 of the State Building Code: Multi-family buildings must be designed to achieve an interior DNL of 45 dBA or less in all habitable residential areas.
- City of San José's Zoning Ordinance. The City's Zoning Ordinance applies specific noise standards to Residential, Commercial and Industrial Zoning Districts which limits the sound pressure levels generated by any use or combination of uses shall not exceed the decibel level at any property line as shown in Table 4.3-1, below.

<b>TABLE 4.3-1</b> <b>CITY OF SAN JOSÉ ZONING CODE NOISE STANDARDS</b>	
<b>Land Uses</b>	<b>Maximum Noise Level at Property Line*</b>
Residential, open space, industrial or commercial uses adjacent to a property used or zoned for residential purposes.	55 dBA
Open space, commercial, or industrial use adjacent to a property used or zoned for commercial purposes or other non-residential use.	60 dBA
Industrial use adjacent to a property used or zoned for industrial or use other than commercial or residential purposes.	70 dBA
*Values may be exceeded with a Conditional Use Permit (CUP).	

#### 4.3.1.1 *Vibration*

One of the challenges with developing suitable criteria for groundborne vibration is the limited research into human response to vibration and, more importantly, human annoyance inside buildings. Experience with rapid transit systems over the last few decades, however, has developed rational vibration limits that can be used to evaluate human annoyance to groundborne vibration. These criteria are primarily based on experience with passenger train operations, such as rapid transit and commuter rail systems. The main difference between passenger and freight operations is the time duration of individual events; a passenger train lasts few seconds whereas a long freight train may last several minutes, depending on speed and length. Although these criteria are based on shorter duration events reflected by passenger trains, they are also used in this assessment to evaluate the potential of vibration annoyance on the site due to large freight trains.

Railroad operations are potential sources of substantial ground vibration depending on distance, the type and the speed of trains, and the type of railroad track. People's response to ground vibration has been correlated best with the velocity of the ground. The velocity of the ground is expressed on the decibel scale. Although not a universally accepted notation, the abbreviation "VdB" is used in this document for vibration decibels to reduce the potential for confusion with sound decibels.

Typical background vibration levels in residential areas are usually 50 VdB or lower, well below the threshold of perception for most humans. Perceptible vibration levels inside residences are attributed to the operation of heating and air conditioning systems, door slams and foot traffic. Construction activities, train operations, and street traffic are some of the most common external sources of vibration that can be perceptible inside residences.

The City of San José has not identified quantifiable vibration limits that can be used to evaluate the compatibility of land uses with the expected vibration environment. Although there are no local standards which control the allowable vibration in new residential development, the U.S. Department of Transportation has developed vibration impact assessment criteria for evaluating vibration impacts associated with rapid transit projects.<sup>14</sup> Vibration impact criteria, based on maximum overall levels

<sup>14</sup> US Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, May 2006, FTA-VA-90-1003-06.

for a single event, have been proposed by the Federal Transit Administration (FTA). The FTA criteria for groundborne vibration impacts are shown in Table 4.3-2, below.

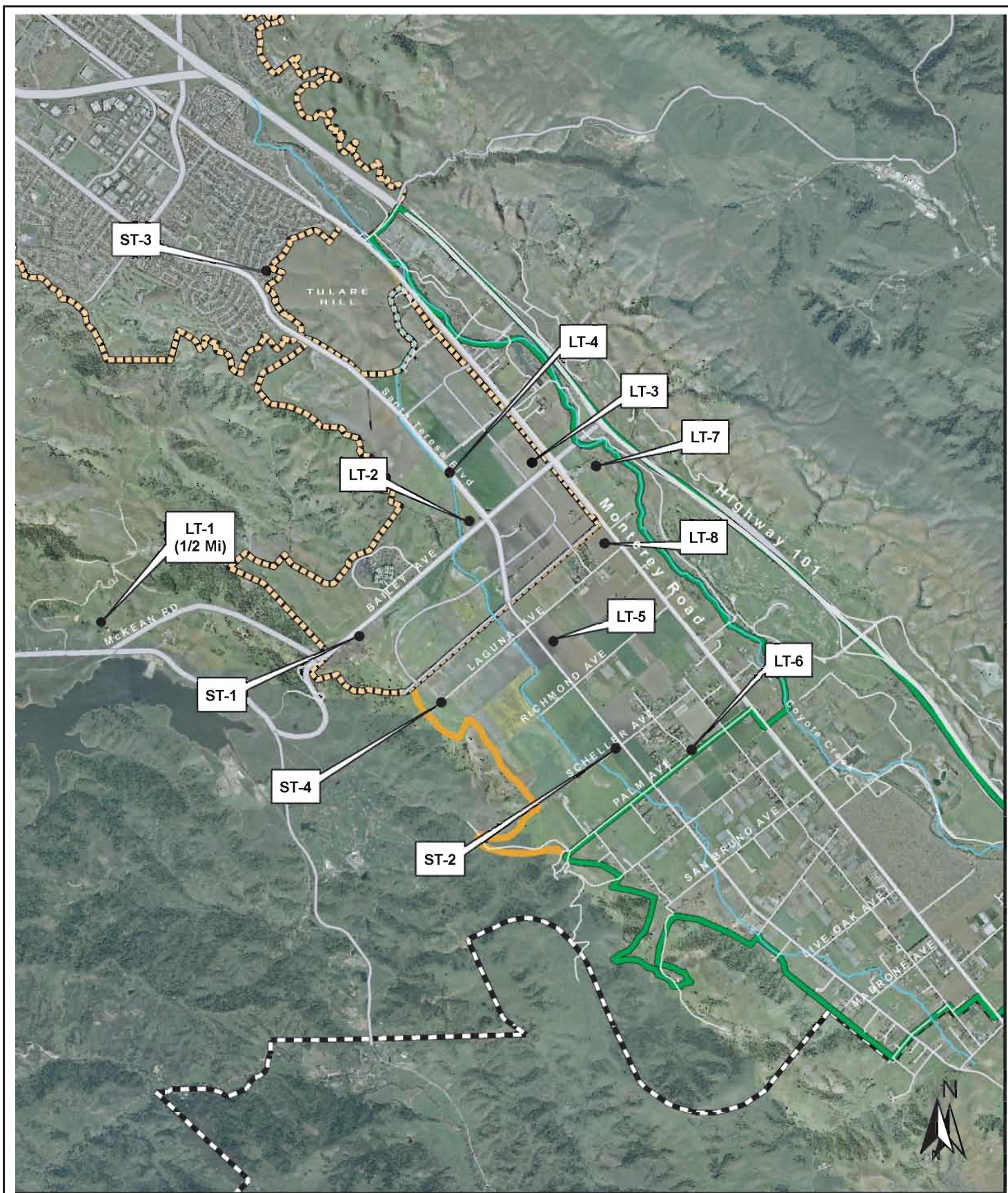
<b>TABLE 4.3-2</b> <b>GROUNDBORNE VIBRATION IMPACT CRITERIA</b>			
Land Use Category	Groundborne Vibration Impact Levels		
	Frequent Events <sup>1</sup>	Occasional Events <sup>2</sup>	Infrequent Events <sup>3</sup>
<b>Category 1</b> Buildings where vibration would interfere with interior operations.	65 VdB <sup>4</sup>	65 VdB <sup>4</sup>	65 VdB <sup>4</sup>
<b>Category 2</b> Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB
<b>Category 3</b> Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB
<b>Notes:</b> 1. "Frequent Events" is defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category. 2. "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day. Most commuter trunk lines have this many operations. 3. "Infrequent Events" is defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines. 4. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration sensitive manufacturing or research should always require detailed evaluation to define the acceptable vibration levels. Ensuring low vibration levels in a building requires special design of HVAC systems and stiffened floors.			
<b>Source:</b> U.S. Department of Transportation, Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006, FTA-VA-90-1003-06.			

## 4.3.2 Existing Setting

### 4.3.2.1 *Existing Noise Sources and Levels*

The existing noise environment in and around the CVSP Development Area varies, but is predominately the result of local transportation noise sources such as existing roadways and the Union Pacific/Caltrain tracks. Existing noise levels were documented at 10 locations within the Development Area at varying distances from the existing roadways. Six long-term noise measurements (i.e., 24-hours or more in duration) and four short-term noise measurements were taken, as shown on Figure 4.3-1. Summaries of the long-term and short-term noise measurements collected are shown in Tables 4.3-3 and 4.3-4, below. Additional details are provided in Appendix D.





NOISE MEASUREMENT LOCATIONS

FIGURE 4.3-1

<b>TABLE 4.3-3</b> <b>LONG-TERM NOISE MEASUREMENT SUMMARY</b>			
Noise Measurement Locations	Noise Levels (dBA)		
	Range of Daytime $L_{eq}$ 's	Range of Nighttime $L_{eq}$ 's	Existing DNL
LT-1: 65 feet from the center of McKean Rd.	61-67	47-64	66
LT-2: 90 feet from the center of Santa Teresa Blvd.	59-68	51-64	66
LT-3: 80 feet from the center of Bailey Ave., east of Santa Teresa Blvd.	61-66	53-64	66
LT-4: 100 feet from the center of Santa Teresa Blvd., north of Bailey Ave.	63-69	52-68	68-69
LT-5: 20 feet from the center of Santa Teresa Blvd., south of Bailey Ave.	67-72	54-71	72-73
LT-6: 65 feet from the center of Palm Ave., east of Santa Teresa Blvd.	58-66	53-63	66
LT-7: 1,400 feet from US 101	57-63	51-62	63
LT-8: 300 feet from the center of Monterey Rd. and 215 feet from the UPRR tracks.	54-68	52-67	68-69

Long-term noise measurements documented the daily trend in noise levels generated by area roadways and the UPRR tracks. As shown in Table 4.3-3, long-term measurements along the existing roadways and UPRR tracks within the CVSP Development Area yielded day-night average noise levels that ranged from 63 to 73 DNL.

<b>TABLE 4.3-4</b> <b>SHORT-TERM NOISE MEASUREMENT SUMMARY</b>						
Noise Measurement Locations	Noise Levels (dBA)					
	$L_{eq}$	$L_{max}$	$L_{10}$	$L_{50}$	$L_{90}$	DNL
ST-1: 50 feet from the center of Bailey Rd., east of IBM Campus.	62	75	67	49	42	65
ST-2: 70 feet from the center of Santa Teresa Blvd., south of Bailey Rd.	63	79	66	50	42	66
ST-3: 80 feet from the center of Santa Teresa Blvd. at Cheltenham Way	65	78	70	62	51	70
ST-4: West end of Laguna Ave.	40	49	43	39	35	<55

Short-term noise measurements were taken at a variety of locations, as identified in the field. Short-term noise levels near the IBM Research Facility on Bailey Avenue were 65 DNL (ST-1), 66 DNL

along Santa Teresa Boulevard south of Bailey Avenue (ST-2), 70 DNL along Santa Teresa Boulevard near Cheltenham Way (ST-3), and less than 55 DNL at the west end of Laguna Avenue (ST-4).

#### **4.3.2.2      *Existing Vibration Levels***

Vibration measurements using seismic grade, low noise accelerometers firmly fixed to the ground were taken in December 2005. This instrumentation is capable of accurately measuring very low vibration levels representative of the levels that would enter a building's foundation. Vibration levels were taken at two setbacks from the Union Pacific Railroad (UPRR) line; one at approximately 60 feet from the track and one at approximately 120 feet from the track. Vibration levels generated by two southbound Caltrains traveling at approximately 50 mph were measured at these setbacks. Vibration levels ranged from 79 to 80 VdB at a distance of 60 feet and from 75 to 76 VdB at a distance of 120 feet from the tracks.

#### **4.3.3      Noise and Vibration Impacts**

##### **4.3.3.1      *Thresholds of Significance***

For the purposes of this project, a noise impact is considered significant if the project would result in:

- exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies; or
- exposure of persons to, or generation of, excessive groundborne vibration or groundborne noise levels; or
- a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or
- a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

While CEQA does not specifically define what noise level increase is considered substantial, generally in high noise environments a project is considered by the City to have a significant impact if the project would: 1) substantially and permanently increase existing noise levels by more than three (3) dBA DNL (three decibels is the minimum increase generally perceptible by the human ear); or 2) would cause ambient noise levels to exceed the guidelines established in the General Plan. It should be noted that the project site is not located within two miles of any airport.

##### **4.3.3.2      *Short-Term Construction Noise Impacts***

#### **Overview**

This section describes the noise impacts that would occur during the construction phases of the CVSP. The significance of construction-related noise is determined by taking into account: 1) the nature and magnitude of the noise, 2) the duration of the noise, and 3) the distance between construction sites and sensitive receptors (e.g., residences, nursing homes, etc.). In general, where noise from construction activities will exceed an hourly Leq of 60 dBA and the ambient noise environment increases by at least five (5) dBA at sensitive receptors for a period more than one construction season, the impact would be considered significant.

Construction activities generate considerable amounts of noise when heavy equipment is used, especially during the grading, excavation, and infrastructure installation phases. The highest maximum noise levels generated by project construction would typically range from about 90 to 105 dBA (impact pile driving) at a distance of 50 feet from the noise source. Typical hourly average construction-generated noise levels (Leq) are about 81 dBA to 89 dBA measured at a distance of 50 feet from the center of the site during busy construction periods (e.g., earth moving equipment, impact tools, etc.) Construction-generated noise levels drop off at a rate of about six dBA per doubling of distance between the source and receptor. Shielding by buildings or terrain often result in lower construction noise levels at distant receptors.

### **Short-Term Noise Impacts**

There are existing single-family residential neighborhoods and individual homes within the Development Area, primarily in the southeastern portion of the area, and in the Greenbelt, to the south of Palm Avenue. Noise impacts resulting from construction depend on the noise generated by various pieces of heavy equipment, the timing and duration of noise generating activities, and the distance between construction noise sources and noise sensitive receptors. Where noise from construction exceeds 60 dBA (hourly Leq) and increases the ambient noise environment by five (5) dBA, the impact is considered significant.

Construction noise impacts primarily result when construction activities occur during noise sensitive times of the day (early morning, evening, or nighttime hours), the construction occurs in areas immediately adjoining noise sensitive land uses, or when construction durations last over extended periods of time. Limiting the hours when construction can occur to daytime hours is often a simple method to reduce the potential for noise impacts. In areas immediately adjacent to construction, controls such as constructing temporary noise barriers and utilizing “quiet” construction equipment can also reduce the potential for noise impacts.

Construction of the proposed project is expected to exceed 60 dBA Leq and increase the ambient noise environment by five dBA adjacent to existing residential uses both within the CVSP Development Area and along Palm Avenue in the Greenbelt. Construction noise in other areas of the Greenbelt would be audible, but would not be significant. Future noise sensitive uses to be constructed within the Development Area would also be impacted by this short-term noise as construction occurs around them. Construction noise impacts to the Coyote Creek Parkway are described in Section 4.6, *Biological Resources*. Given the size of the project and the types of urban development proposed, such elevated noise levels will likely extend over many construction seasons. For the reasons described above, the project would result in significant construction-related noise impacts.

**Impact NOI-1:** The proposed project would result in construction-related noise impacts in proximity to existing and future residential areas and other noise sensitive uses within the CVSP Development Area and the southern Greenbelt.  
**[Significant Impact]**

#### **4.3.3.3      *Long-Term Noise Impacts within the Development Area***

This section of the EIR describes noise impacts that would occur over the long-term as a result of implementation of the CVSP. Such impacts can include: 1) the effect of existing noise levels on proposed land uses, 2) the effects of noise generated by new land uses on other existing/future land uses, and 3) the effect of noise from increased traffic on existing future land uses along various



roadways within the CVSP Development Area. The impacts described below would apply to both existing and future uses within the CVSP Development Area.

### **Commercial/Residential Interface**

New commercial/retail uses would be constructed within the CVSP Development Area. Depending upon the configuration of the final land use plan, noise associated with commercial uses (e.g., heating & air conditioning equipment, parking lot activities, loading docks, etc.) could exceed 55 dBA DNL at the property lines of existing/future residences.

**Impact NOI-2:** Residences could be exposed to noise levels that exceed the 55 dBA DNL noise limit standard set by the City's General Plan. **[Significant Impact]**

### **Workplace/Residential Interface**

Properties within the CVSP Development Area would be developed with Workplace uses including R&D and office uses. Depending upon the configuration of the final land use plan, noise associated with R&D uses (e.g., heating & air conditioning equipment, emergency back-up generators, parking lot activities, loading docks, etc.) could exceed 55 dBA DNL at the property lines of nearby existing and future residences.

**Impact NOI-3:** Residences could be exposed to noise levels that exceed the 55 dBA DNL noise limit standard set by the City's General Plan. **[Significant Impact]**

### **Noise from Proposed Outdoor Playfields/Schools**

The CVSP includes the development of playfields, some of which are associated with future school uses. The playfields proposed as part of the CVSP would generate noise from players, spectators, and potentially, public address systems. Maximum noise levels from such uses can exceed 80 dBA Lmax (single-events) at a distance of approximately 150 feet and 55 DNL at the property line with residential uses. The playfields would include lighting and, therefore, noise would also occur during evening hours. Existing residences within the CVSP Development Area are not expected to be affected by such noise due to the long distances from these proposed uses. Future residences would, however, be located in proximity to the future playfields/schools and could be adversely impacted by their noise-generating activities. The preparation of a Specific Plan for the area would allow future residents to know where such playfields and schools would be located, potentially reducing the potential for complaints regarding noise generated at these uses. In other words, residents could choose not to purchase residential units in proximity to existing or future playfields/schools.

**Impact NOI-4:** Future residential uses could be exposed to increased noise levels generated by proposed outdoor playfields/schools. **[Significant Impact]**

### **Noise from New Fire Stations**

The proposed project includes the construction of two new fire stations; one on Bailey Avenue in the north and one near Santa Teresa Boulevard in the southern portion of the CVSP Development Area. Noise-generating activities associated with the operation of a fire station include sirens sounding as vehicles leave the station, the testing of engines during the morning check, weekly testing of the emergency generator, and minimal training exercises. Sirens are only sounded when necessary as trucks leave the station, and are therefore determined to be single-event noise sources for which there are no noise thresholds.

Noise measurements taken at fire stations during the morning equipment checkout indicate that maximum noise levels at a distance of 50 feet from an activity can reach 80 to 85 dBA Lmax. Typically, such activities are within the range of vehicular traffic noise when stations are located adjacent to major streets (as is the case here). Normally, an emergency generator is tested weekly. If the equipment is similar to other fire stations in San José, it is anticipated that the standby generators would cause a noise level of about 60 dBA at a distance of 50 feet. Proper siting of this equipment would result in noise levels consistent with the San José Emergency Generator Ordinance.

**Impact NOI-5:** Future and existing residents of the CVSP Development Area would be exposed to noise generated by proposed fire stations. These impacts would be less than significant. **[Less than Significant Impact]**

### **Noise from Roadways and Trains**

A direct effect of new urban development in the CVSP Development Area would be an increase in traffic on various roadways, which in turn could increase traffic-generated noise at land uses located near those facilities. As described above in Section 4.3.2.1, much of the CVSP Development Area is currently exposed to existing noise levels that exceed the City's residential short-term exterior noise goal of 60 dBA DNL. While existing residents are already being exposed to these noise levels, project-generated traffic would be expected to further increase the existing noise levels.

As part of the noise analysis prepared for this EIR, the degree to which the proposed urban development would increase traffic noise above existing levels was quantified. This analysis was based upon the results of the traffic study prepared for the project by *Hexagon Transportation Consultants* (Appendix C). Noise contour distances for area roadways were calculated with a traffic model based on project build-out traffic volumes and preliminary design information for arterial and collector roadways. Vehicle-mix and speed assumptions were input into the traffic noise model to create worst-case projections (shielding was not accounted for) of noise levels within the CVSP Development Area.

As shown in Table 4.3-5, US 101 would continue to be the predominant noise source at the easternmost portion of the CVSP Development Area. Roadways that would generate noise levels greater than 70 dBA DNL at a distance of 100 feet from the centerline include Monterey Road, Coyote Creek Road, and portion of Coyote Valley Parkway, Scheller Avenue, and Bailey Avenue. Noise levels on Santa Teresa Boulevard are also expected to be in excess of 70 dBA DNL at 100 feet from the roadway center. Other roadways are projected to generate noise levels as shown in Table 4.3-5.

**TABLE 4.3-5  
FUTURE NOISE CONTOUR DISTANCES FROM CVSP ROADWAYS  
(Feet from Road Center)**

<b>Roadway</b>	<b>Segment</b>	<b>70 dBA DNL*</b>	<b>65 dBA DNL</b>	<b>60 dBA DNL</b>
US 101	Metcalf Road to Coyote Creek Golf Drive	650	1400	3020
Monterey Road	North of Coyote Valley Parkway	180	400	860
	South of Coyote Valley Parkway	180	400	860
	South of Bailey Avenue	180	400	860
	South of East Central Blvd.	180	400	860
	South of Scheller Ave/Coyote Creek Golf Drive	180	400	860
Coyote Creek Road	South of Coyote Valley Parkway	150	310	680
	South of Industrial Parkway	170	360	780
	South of Bailey Avenue	170	370	800
	South of East Central Blvd.	160	340	730
	South of Silver Drive	150	330	710
	South of Scheller Ave/Coyote Creek Golf Drive	110	240	510
	South of Coyote Drive	90	200	430
Santa Teresa Boulevard	North of Coyote Valley Parkway	120	250	540
	South of Coyote Valley Parkway	70	160	340
	South of Industrial Parkway	--	70	160
	South of Sobrato Road	90	180	400
	South of East Central Blvd.	90	190	410
	South of Scheller Ave/Coyote Creek Golf Drive	--	80	170
	South of Coyote Drive	--	60	140
Coyote Valley Parkway	East of Monterey Road	170	360	770
	East of Coyote Creek Road	190	410	880
	East Of Patane Way	80	170	360
	East of Santa Teresa Blvd.	60	120	260
	West of Santa Teresa Blvd.	80	170	380
	South of Industrial Parkway	90	200	440
	South of Bailey Avenue	90	190	410
Fisher Creek Boulevard	South of Sobrato Road	90	180	400
	South of West Central Blvd.	90	200	430
	South of East Central Blvd.	80	180	390
	East of Palm Canyon	80	180	390
Scheller Avenue	East of Santa Teresa Blvd.	80	170	360
	South of Silver Drive	80	170	360
	East of Coyote Creek Road	160	350	750
	East of Monterey Rd./Coyote Creek Golf Drive	160	350	760
Bailey Avenue	West of Hillside Road	50	120	250
	East of Hillside Road	70	150	310
	East of Sobrato Road	60	130	280

<b>TABLE 4.3-5</b> <b>FUTURE NOISE CONTOUR DISTANCES FROM CVSP ROADWAYS</b> <b>(Feet from Road Center)</b>				
<b>Roadway</b>	<b>Segment</b>	<b>70 dBA DNL*</b>	<b>65 dBA DNL</b>	<b>60 dBA DNL</b>
Bailey Avenue (cont.)	East of Santa Teresa Blvd.	--	50	120
	East of Lakeside Drive	--	70	150
	East of Central Loop Road	60	130	270
	East of Coyote Creek Road	220	470	1020
	East of Monterey Road	210	440	960
Sobrato Road	South of Bailey Avenue	70	150	330
	South of Fisher Creek Drive	70	150	330
Palm Canyon	South of Fisher Creek Drive	50	100	220
Lakeside Drive	East of Santa Teresa Blvd.	--	70	150
	South of Bailey Avenue	--	70	140
	South of 10th Street	80	180	390
Outer Lake Road	East of Santa Teresa Blvd.	--	80	180
	South of Bailey Avenue	--	90	180
Central Loop Road	East of Santa Teresa Blvd.	--	60	130
	South of Bailey Avenue	--	70	150
	South of 10th Street	50	120	250
	South of W. Central Blvd.	--	60	140
10th Street	East of Lakeside Drive	70	160	340
	East of Central Loop Road	60	130	280
Industrial Parkway	East of Santa Teresa Blvd.	80	170	360
Silver Drive	East of Scheller Avenue	--	80	160
West Central Boulevard	East of Fisher Creek Drive	--	60	140
	East of Santa Teresa Blvd.	--	60	140
East Central Boulevard	East of Fisher Creek Drive	--	60	140
	East of Santa Teresa Blvd.	--	50	110
Coyote Drive	East of Santa Teresa Blvd.	--	--	90
*Data not reported within 50 feet of the roadway center.				

The number of railroad trains traveling on the UPRR corridor through the CVSP Area may increase in the future as a result of additional commuter trains planned to and from Morgan Hill and Gilroy (Caltrain) and additional through freight and passenger trains (Amtrak). DNL noise levels would vary depending on the ultimate number of trains and timing of the pass-by events. The future maximum noise levels during pass-by events would be expected to be similar to existing conditions. Railroad trains would be expected to generate maximum noise levels ranging from 90 to 100 dBA Lmax (single-event, such as train whistles) at a distance of 100 feet from the railroad tracks. The existing 70 dBA DNL noise contour is located approximately 150 feet from the center of the tracks.

**Impact NOI-6:** The proposed project would result in significant noise impacts to new and existing sensitive receptors within the CVSP Development Area associated with project-generated traffic and railroad operations. **[Significant Impact]**

## Vibration Impacts

The project proposes to locate vibration-sensitive residential land uses adjacent to the existing Union Pacific Railroad (UPRR) tracks. Freight and passenger trains, including Amtrak and Caltrain, currently pass through the CVSP Area a total of between 30 and 70 times per day. Therefore, the “occasional” compatibility threshold of 75 VdB is used in the evaluation of the project with respect to vibration compatibility. Based on the results of the vibration measurements made, the calculated 75 VdB contour distance is 150 feet from the center of the railroad track. Residential uses planned within 150 feet of the center of the railroad track would be exposed to vibration levels greater than 75 VdB. This is a significant impact.

While some workplace uses could be sensitive to groundborne vibration, it is anticipated that R&D uses that require the use of equipment or instruments sensitive to vibration would not locate near the existing UPRR tracks.

**Impact NOI-7:** The proposed project would result in the exposure of sensitive residential uses to significant groundborne vibration levels due to the railroad activity on the existing UPRR tracks. **[Significant Impact]**

### 4.3.3.4 *Long-term Noise Impacts to Areas Outside of the Development Area*

As previously described, a direct effect of new urban development in the CVSP area would be an increase in traffic on various roadways outside of the CVSP Development Area, which in turn, could increase traffic-generated noise at land uses located along those facilities. As part of the noise analysis prepared for this EIR, the degree to which the CVSP project would increase traffic noise above existing levels along roadways outside the CVSP Development Area was quantified. For roadways with adjacent sensitive receptors and where DNL along the roadways is currently 60 dBA or greater, increases of three decibels or greater over existing levels is considered significant. Table 4.3-6 shows only those roadway segments that would experience a noise increase of over 3 dBA with the CVSP project and/or have adjacent sensitive receptors such as residences. Industrial and commercial uses would not generally be affected by an increase in traffic noise. A comparison between background conditions and the project conditions is also included to show the noise differences between what could be built now in the Coyote Valley and the proposed CVSP project.

Based upon the results of the traffic study prepared for the project by *Hexagon Transportation Consultants* (Appendix C), the proposed project would increase traffic noise levels at locations surrounding the CVSP Development Area. The data indicate that, when compared to background conditions, noise levels along various roadways in the area surrounding the CVSP Area, including the Greenbelt and City of Morgan Hill, are expected to increase and sensitive receptors would be exposed to higher noise levels. Since there are residences and other sensitive receptors located along the roadway segments listed in Table 4.3-6, and since the DNL along these roadways would increase more than 3dBA, this noise impact would be significant.

**Impact NOI-8:** The proposed project would result in significant noise impacts along roadways in areas outside the CVSP Development Area. **[Significant Impact]**

<b>TABLE 4.3-6</b> <b>COMPARISON OF NOISE LEVELS ALONG PROJECT AREA ROADWAYS</b> <b>(Expressed in dBA as Increases in the DNL over Existing Levels)</b>				
<b>City of San José</b>				
<b>Roadway</b>	<b>Segment</b>	<b>DNL Noise Increase above Existing Noise Levels (dBA)</b>		<b>Difference</b>
		<b>Background</b>	<b>Project (CVSP)</b>	
Monterey Road	Monterey Plaza to Ford Road	2	3	+1
	Ford Road to Flintwell Way	2	3	+1
	Flintwell Way to Bernal Road	2	3	+1
	Bernal Road to Menard Dr.	4	5	+1
	Menard Dr. to CVSP Area	5	6	+1
Santa Teresa Blvd.	Cottle Road to Encinal Dr.	2	3	+1
	Encinal Dr. to Miyuki Dr.	3	3	0
	Miyuki Dr. to San Ignacio Ave.	3	3	0
	San Ignacio Ave. to Great Oaks Blvd.	4	5	+1
	Great Oaks Blvd. to Martinvale Lane	5	5	0
	Martinvale Lane to Bernal Road	3	4	+1
	Bernal Road to Chantilly Lane	4	4	0
	Chantilly Lane to Avenida Espana	4	4	0
	Avenida Espana to Cheltenham Way	6	6	0
	Cheltenham Way to Bayliss Dr.	6	6	0
	Bayliss Dr. to CVSP	6	6	0
Bernal Road	Via Del Oro to San Ignacio Ave.	4	4	0
	San Ignacio Ave. to Monterey Road	3	3	0
McKean Road	Harry Road to Bailey Ave.	3	4	+1
Harry Road	McKean Road to Almaden Expwy.	2	3	+1
<b>City of Morgan Hill</b>				
Monterey Road	Kirby Ave. to Tilton Ave.	3	5	+2
	Tilton Ave. to Burnett Ave.	2	4	+1
	Burnett Ave. to Peebles Ave.	2	3	+1
	Peebles Ave. to Madrone Pkwy.	2	3	+1
	Madrone Pkwy. To Cochrane Rd.	2	3	+1
Tilton Ave.	Hale Ave. to Dougherty Ave.	3	3	0
	Dougherty Ave. to Monterey Rd.	3	3	0
Cochrane Road	Monterey Road to Butterfield Blvd.	2	3	+1
Butterfield Blvd.	Cochrane Road to Sutter Blvd.	2	4	+2
*Measured at 75 feet from the centerline of the roadways. <b>Note:</b> Roadway segments not listed are those for which a significant increase in noise would not occur with the proposed project and/or where there are no sensitive receptors (e.g., residences).				



## **Noise Impacts as a Result of Construction of Bailey-over-the-Hill**

The construction of the Bailey-over-the-Hill roadway would result in construction noise impacts similar to those of the proposed project, depending upon the ultimate alignment chosen. It is also expected that future long-term noise levels would increase between four and five decibels at residential receivers along McKean Road to Almaden Expressway. This is a significant impact. It should be noted that the roadway alignment has not yet been chosen for the future BOH roadway, but the farther away the roadway is aligned from sensitive receptors, the lower the noise levels would be.

**Impact NOI-9:** It is anticipated that the future construction of the BOH roadway would result in significant impacts associated with short-term construction and long-term noise levels. **[Significant Impact]**

### **4.3.4 Mitigation and Avoidance Measures for Noise Impacts**

As previously described, the policies in the City of San José's 2020 General Plan have been adopted for the purpose of avoiding or mitigating environmental effects resulting from planned development within the City. Future CVSP development projects shall be subject to these General Plan policies, as well as the following standard measures to mitigate environmental impacts. Additional or modified mitigation measures may be identified based on subsequent environmental review, once specific development is proposed.

#### **4.3.4.1 *Mitigation Measures for Short-Term Construction Noise***

Given the timeframe for development build-out (25 to 50 years), construction within the CVSP Development Area could occur continually for years. Therefore, while the following standard measures would reduce impacts associated with short-term construction, they would not reduce them to a less than significant level.

**MM NOI-1.1:** An acoustical analysis shall be completed prior to issuance of development permits to determine necessary and feasible noise-attenuation practices during construction to the satisfaction of the Director of Planning, Building, and Code Enforcement.

**MM NOI-1.2:** As required by San José Municipal Code §20.100.450 construction hours within 500 feet of residences shall be limited to the hours of 7 am - 7 pm weekdays, and subject to a planning development permit. Construction outside of these hours may be approved through a development permit based on a site-specific construction noise mitigation plan and a finding by the Director of Planning, Building, and Code Enforcement that the construction noise mitigation plan is adequate to prevent noise disturbance of affected residential uses.

**MM NOI-1.3:** All construction equipment powered by internal combustion engines shall be equipped with intake and exhaust mufflers that are in good condition and appropriate for the equipment.

**MM NOI-1.4:** For construction sites with nearby residences, stationary noise-generating equipment shall be located as far as possible from the homes.

- MM NOI-1.5:** Where pile drivers are needed, the use of multiple-pile drivers shall be considered in order to expedite construction. Although noise levels generated by multiple pile drivers would be higher than the noise generated by a single pile driver, the total duration of pile driving activities would be reduced.
- MM NOI-1.6:** Temporary noise control blanket barriers shall shroud pile drivers or be erected in a manner to shield the adjacent land uses. Such noise control blanket barriers can be rented and quickly erected.
- MM NOI-1.7:** Where feasible, foundation pile holes shall be pre-drilled to minimize the number of impacts required to seat the pile. Pre-drilling foundation pile holes is a standard construction noise control technique. Pre-drilling reduces the number of blows required to seat the pile.
- MM NOI-1.8:** During the project implementation stage, contractors shall prepare detailed construction plans that identify the schedule for major noise-generating construction activities. The construction plans shall identify a procedure for coordination with the adjacent noise sensitive uses so that construction activities can be scheduled to minimize noise disturbance. A phone number for complaints shall be posted at the construction site(s) and all complaints shall be investigated and addressed.

#### **4.3.4.2**      *Mitigation for Long-Term Noise within the Development Area*

##### **Mitigation for Elevated Noise Levels at Commercial/Residential and Workplace/Residential Interfaces**

- MM NOI-2.1  
and 3.1:** The project shall be designed to the fullest extent possible so that noise from the commercial and workplace uses will not exceed an DNL of 55 dBA at the property lines of existing/future residences. This will be accomplished by proper site design (e.g., setbacks, locating loading docks away from residences, etc.), the shielding of outdoor equipment, and/or the installation of noise barriers in accordance with the recommendations of a project-level acoustical analysis to be prepared prior to issuance of development permits and to the satisfaction of the Director of Planning, Building, and Code Enforcement.
- MM NOI-2.2  
and 3.2:** Prior to project-level planning permits for new residential development, a qualified Acoustical Engineer shall be retained to identify areas of the sites which exceed the 60 DNL contour. The project design would then incorporate measures for minimizing or avoiding noise impacts, which could include a combination of open space buffer areas, sound barriers, and building/site design to create outdoor use areas with noise exposures of 60 DNL or less. As an alternative when appropriate, less sensitive land uses (such as parking, passive open space, mechanical equipment, etc.) could be located between more sensitive uses allowing for a compatible residential noise environment.

**MM NOI-2.3  
and 3.3:**

Prior to issuance of building permits for structures located within the 60 DNL contour, a qualified Acoustical Engineer shall be retained to prepare a detailed acoustical analysis of exterior and interior noise reduction requirements and specifications for all project phases, in accordance with City and state standards. Project-specific acoustical analyses are mandated by the state for new multi-family uses. Appropriate noise control treatments necessary to achieve a compatible interior noise environment (45 DNL) shall be incorporated. Interior noise levels could be reduced to acceptable levels by including such measures as forced-air mechanical ventilation systems and/or sound-rated construction to allow occupants the option of controlling noise in interior spaces by maintaining windows closed.

**Mitigation for Noise from the Proposed Playfields/Schools**

- MM NOI-4.1:** The project shall be designed so that noise from the playfields/schools will not exceed a DNL of 55 dBA at the property lines of nearby existing residences. This will be accomplished by proper site design (e.g., setbacks) and by locating outdoor playing fields and bleachers as far as practical from future residents.
- MM NOI-4.2:** The public address systems (if installed) shall be designed to focus amplified sounds toward spectator areas only, so as to minimize the effect on nearby future residents.

**Mitigation for Roadway and Train Noise within the Development Area**

- MM NOI-6.1:** The project shall be designed to the fullest extent possible so that noise from future roadway traffic will not exceed a DNL of 55 dBA at the property lines of existing/future residences. This will be accomplished by proper site design (e.g., setbacks, locating loading docks away from residences, etc.), the shielding of outdoor equipment, and/or the installation of noise barriers.
- MM NOI-6.2:** Multi-family housing proposed on any site within the CVSP Development Area is subject to the requirements of Title 24, Part 2, of the State Building Code. Prior to the project-level design review process for new residential development, a qualified Acoustical Engineer shall be retained to identify areas of the sites which exceed the 60 DNL contour. The project design shall incorporate to the fullest extent possible, measures for minimizing or avoiding noise impacts, which could include a combination of open space buffer areas, sound barriers, and building/site design to create outdoor use areas with noise exposures of 60 DNL or less. As an alternative, less sensitive land uses (such as parking, passive open space, mechanical equipment, etc.) should be located between roadways and more sensitive uses, allowing for a compatible residential noise environment.
- MM NOI-6.3:** Prior to issuance of building permits, a qualified Acoustical Engineer shall be retained to prepare a detailed acoustical analysis of exterior and interior noise reduction requirements and specifications for all project phases, in accordance with City and state standards. Project-specific acoustical analyses are mandated by the state for new multi-family uses. Appropriate noise

control treatments necessary to achieve a compatible interior noise environment (45 DNL or less in all habitable residential areas, per the General Plan) shall be incorporated into the proposed structures located within the 60 DNL contour. Interior noise levels could be reduced to acceptable levels by including such measures as forced-air mechanical ventilation systems and/or sound-rated construction to allow occupants the option of controlling noise in interior spaces by maintaining windows closed.

**MM NOI-6.4:** Outdoor use areas associated with the proposed residences shall be designed and sited so that noise levels do not exceed a DNL of 60 dBA. This will be accomplished through site design (e.g., creating sufficient buffers/setbacks between noise sources and these areas, shielding such areas from noise sources by locating them behind buildings, etc.) and/or constructing soundwalls or noise control barriers, in accordance with the recommendations of the project-level acoustical analysis.

**MM NOI-6.5:** In the event that residential patios are constructed in locations where the DNL is not reduced to 60 dBA by the steps described in the previous measure, such patios shall be designed to include acoustically-effective (i.e., without cracks, gaps, openings, etc.) fencing.

**MM NOI-6.6:** Where feasible, noise barriers/soundwalls would be constructed along the edge of street rights-of-way to protect existing and future residential land uses. This measure is not feasible where residences, churches and schools front onto roadways because of the necessity to leave gaps in the soundwalls for driveways. It should also be noted that there are locations where tall soundwalls may not be desirable from a visual and aesthetic perspective. The feasibility of providing mitigation at affected noise-sensitive receivers will be determined by a detailed study of the affected roadway segments to be completed prior to issuance of planning permits, and to the satisfaction of the City's Director of Planning, Building, and Code Enforcement.

#### **4.3.4.3**      *Mitigation Measures for Vibration Impacts*

**MM NOI-7.1:** Residential uses shall be located at or less than 150 feet from the center of the railroad tracks. At this distance, impacts would be less than significant.

**MM NOI-7.2:** If residential structures are proposed within 150 feet, site-specific vibration monitoring studies shall be done during subsequent design of each residential development to confirm the allowable vibration setback. Vibration levels shall not exceed 75 VdB measured vertically on the ground at any residential building site, consistent with Federal Transit Administration Guidelines.

**MM NOI-7.3:** Based upon the results of the vibration monitoring study, proper support of foundation systems for residential structures within 150 feet of the railroad tracks shall be implemented and building design shall avoid resonant frequencies that coincide with primary frequencies of train-generated ground vibration (10 Hz and 20 Hz). Vibration isolation of buildings has been recently considered for residential applications.

**MM NOI-7.4:** Resilient support of the railroad tracks using ballast mats or a shredded tire underlay can be implemented to reduce vibration levels by three to four VdB. This measure would require coordination with UPRR.

#### **4.3.4.4**      *Mitigation for Roadway Noise Outside of the Development Area*

**MM NOI-8.1:** Where feasible, noise barriers/soundwalls would be constructed along the edge of street rights-of-way to protect existing and future residential land uses. This measure is not feasible where residences, churches and schools front onto roadways because of the necessity to leave gaps in the soundwalls for driveways. It should also be noted that there are locations where tall soundwalls may not be desirable from a visual and aesthetic perspective. The feasibility of providing this mitigation at affected noise-sensitive receivers will be determined by a detailed study of the affected roadway segments to be completed prior to the project-level design review process and to the satisfaction of the City's Director of Planning, Building, and Code Enforcement.

**MM NOI-8.2:** Consideration shall be given on a case-by-case basis to replacing older doors and single-paned windows that are exposed to significant traffic noise at locations where existing residences front onto roadways with those that are acoustically-rated.

**MM NOI-8.3:** Alternative noise reduction techniques would be implemented such as re-paving streets with "quiet" pavement types such as Open-Grade Rubberized Asphaltic Concrete, if feasible. The use of "quiet" pavement can reduce noise levels by two to five dBA depending on the existing pavement type, traffic speed, traffic volumes, and other factors.

**MM NOI-8.4:** Traffic calming measures to slow traffic would be installed, as described in MM TRAN-22.

#### **4.3.4.6**      *Mitigation Measures for BOH Noise Impacts*

**MM NOI-9.1:** Future construction of the BOH roadway would be subject to San José 2020 General Plan policies limiting noise impacts, as well as other measures to be considered at the time of development. These policies and measures will be similar to those described above in this section.

### **4.3.4**      **Conclusions regarding Noise and Vibration Impacts**

**Impact NOI-1:** The proposed project would result in construction-related noise impacts in proximity to existing and future residential areas within the CVSP Development Area and the southern Greenbelt. Due to the length of time expected to implement the CVSP, implementation of the mitigation and avoidance measures described above (MM NOI-1.1 through 1.8) would not reduce these impacts to a less than significant level. Approval of the CVSP would require a statement of overriding considerations. **[Significant Unavoidable Impact]**

- Impact NOI-2:** Conformance with the future CVSP Design Guidelines will reduce commercial/residential interface noise impacts to a less than significant level. Implementation of the mitigation and avoidance measures described above (MM NOI-2.1 through 2.3) would reduce these impacts to a less than significant level. **[Less than Significant Impact with Mitigation Incorporated]**
- Impact NOI-3:** Conformance with the General Plan policies and all applicable zoning regulations will reduce commercial/workplace interface noise impacts to a less than significant level. Implementation of the mitigation and avoidance measures described above (MM NOI-3.1 through 3.3) would reduce these impacts to a less than significant level. **[Less than Significant Impact with Mitigation Incorporated]**
- Impact NOI-4:** Future residential uses could be exposed to increased noise levels generated by proposed outdoor playfields and school activities. Implementation of the mitigation and avoidance measures described above (MM NOI-4.1 and 4.2) would reduce these impacts to a less than significant level. **[Less than Significant Impact with Mitigation Incorporated]**
- Impact NOI-5:** Future and existing residents of the CVSP Development Area would be exposed to noise generated by proposed fire stations. However, these impacts would be less than significant. **[Less than Significant Impact]**
- Impact NOI-6:** The proposed project would result in significant project-generated traffic noise impacts to new and existing residential uses within the CVSP Development Area. Implementation of the mitigation and avoidable measures described above (MM NOI-6.1 through 6.6) would reduce these impacts to a less than significant level. **[Less than Significant Impact with Mitigation Incorporated]**
- Impact NOI-7:** The proposed project would result in the exposure of sensitive residential uses to significant groundborne vibration levels due to the presence of the existing UPRR tracks. Implementation of the mitigation and avoidance measures described above (MM NOI-7.1 through 7.4) would reduce these impacts to a less than significant level. **[Less than Significant Impact with Mitigation Incorporated]**
- Impact NOI-8:** The proposed project would result in significant noise impacts along roadways in areas outside the CVSP Development Area. Implementation of the mitigation and avoidable measures described above (MM NOI-7.1 through 7.4) would reduce these impacts to a less than significant level, where they are feasible. Because they are not expected to be feasible at all locations, the impact is significant and unavoidable and a statement of overriding considerations would be required for adoption of the CVSP. **[Significant Unavoidable Impact]**
- Impact NOI-9:** Future construction of the BOH roadway would result in significant impacts associated with short- and long-term noise levels. Future construction of the BOH roadway would be subject to San José 2020 General Plan policies intended to minimize noise impacts, as well as other measures to be



considered at the time of development which would be similar to those described above in this section that relate to project-specific impacts.  
**[Less than Significant Impact with Mitigation Incorporated]**